# SYNTHESIS AND CHARACTERIZATION OF SILICON CARBIDE FROM COCONUT SHELL (*Cocos nucifera*) AND ITS POTENTIAL IN PHOTOVOLTAIC CELL APPLICATION

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## ACCEPTANCE SHEET

The undergraduate thesis entitled **SYNTHESIS AND CHARACTERIZATION OF SILICON CARBIDE FROM COCONUT SHELL (*Cocos nucifera*) AND ITS POTENTIAL IN PHOTOVOLTAIC CELL APPLICATION** prepared and submitted by **IAN JASPER R. AMPELOQUIO** in partial fulfillment of the requirements for the degree of **BACHELOR OF SCIENCE IN CHEMISTRY,** is hereby accepted.

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## BIOGRAPHICAL SKETCH

Ian Jasper Ramones Ampeloquio, the author of this paper and the researcher of this study, is a native of Dagupan, San Mateo, Isabela. Born on October 07, 1997, he finished his primary education at the Dagupan Elementary School as the class valedictorian on March 2010. He took his secondary education at the Eveland Christian College of San Mateo, Isabela and graduated on March 2014. As of writing, he studies at Central Luzon State University, Nueva Ecija taking up Bachelor of Science in Chemistry.

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## ABSTRACT

**IAN JASPER R. AMPELOQUIO.,** Department of Chemistry, College of Arts and Sciences, Central Luzon State University, Science City of Muñoz, Nueva Ecija, Philippines. **JUNE 2018, SYNTHESIS AND CHARACTERIZATION OF SILICON CARBIDE FROM COCONUT SHELL (*cocos nucifera*) AND ITS POTENTIAL IN PHOTOVOLTAIC CELL APPLICATION**

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**Background:** Coconut industry is one of the dominant sectors in Philippine agriculture. Being one of the largest industries, coconut processing often leaves large amount of agricultural wastes. Coconut shells contains relatively-high amount of silica and carbon, sources which are important in the synthesis of Silicon Carbide (SiC) as a valuable material that can be used in different industries. The synthesized Silicon Carbide was tested for its potential in solar photovoltaic cell application by measuring the band gap energy. A semiconductor for solar photovoltaic cell must have a band energy gap in the range of 1.1 to 1.7 eV. **Method:** SiC synthesis usually requires high energy but this study used Magnesiothermic Reduction, a low cost and low energy method in the synthesis of Silicon Carbide. Different magnesium loading was used to synthesized Silicon Carbide. **Results:** The synthesis was successfully done as supported by SEM-EDX and FTIR analyses. The measured band gap energies of the synthesized SiC from coconut shell regardless of the magnesium loading was about 2.1 eV. Doping the products using different concentrations of $Na_2HPO_4$ results in the lowering of the band gap energy to as low as 1.39 eV. **Conclusion:** Silicon carbide can be synthesized using magnesiothermic reduction method and doping the products promises a potential for photovoltaic solar cell application.



***Keywords*:** Coconut Shell, Silicon Carbide, Magnesiothermic Reduction, Solar Photovoltaic Cell.

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